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THE
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☞See advertisement on last page.

Poetry.

SONG OF STEAM.

Harness me down with your iron bands,
Be sure of your curb and rein,
For I scorn the strength of your puny hands,
As the tempest scorns a chain ;
How I laughed as I lay concealed from sight
For many a countless hour,
At the childish boast of human might,
And the pride of human power !
When I saw an army upon the land,
A navy upon the seas,
Creeping along, a snail-like band,
Or waiting a wayward breeze ;
When I marked the peasant faintly reel
With the toil which he faintly bore
As he turned at the tardy wheel,
Or tugged at the weary oar :—

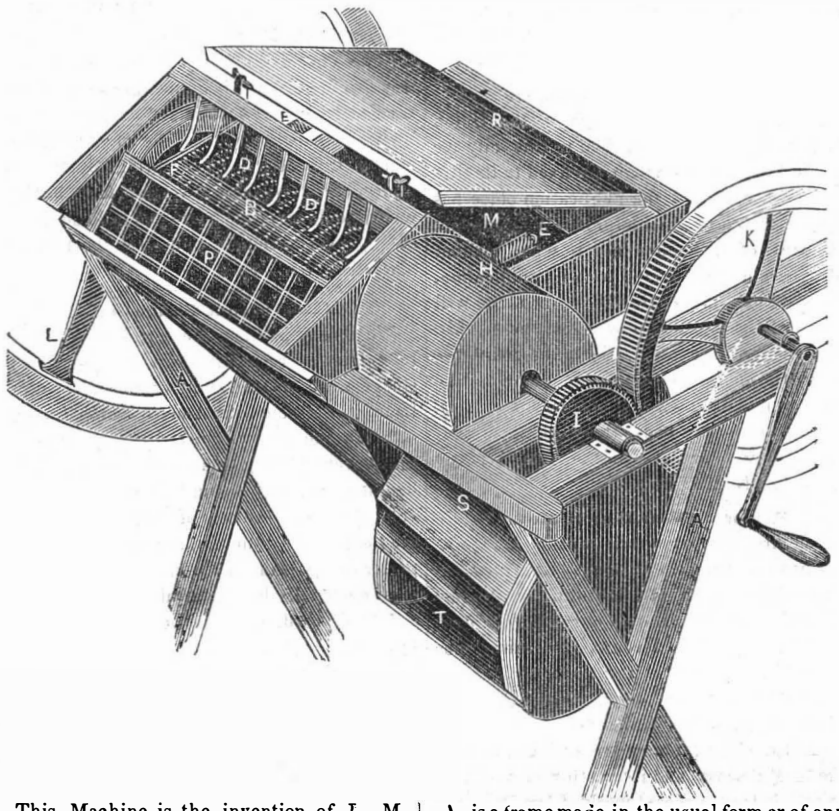
When I measured the panting courser's speed
The flight of the carrier dove,
As they bore a law, a king's decree,
Or the lines of impatient love ;
I could not but think how the world would feel
As these were outstripped afar,
When I should be bound to the rushing keel,
Or chained to the flying car !
Ha ! ha ! ha ! They found me at last ;
They invited me forth at length ;
And I rushed to my throne with a thunderblast
And laughed in my iron strength !
Oh ! then ye saw a wondrous change
On the earth and the ocean wide,
Where now my fiery armies range,
Nor wait for wind or tide.

Hurrah ! hurrah ! the winter's o'er
The mountain's steep decline ;
Time—space have yielded to my power—
The world—the world is mine !
The giant streams of the queenly West,
And the Orient floods divine.
The ocean pales where'er I sweep
To hear my strength rejoice,
And the monsters of the briny deep
Cower trembling at my voice.
I carry the wealth and the lord of earth ;
The thoughts of the god-like mind ;
The wind lags after going forth,
The lightning is left behind.
In the darksome depths of the fathomless mine
My tireless arm doth play,
Where the rocks ne'er saw the sun decline
Or the dawn of the glorious day.
I bring earth's glittering jewels up
From the hidden caves below,
And I make the fountain granite cup
With a crystal gush o'erflow !

I blow the bellows, I forge the steel,
In all the shops of trade ;
I hammer the ore, and turn the wheel,
Where my arms of strength are made.
I manage the furnace, the mill, the mint—
I carry, I spin, I weave ;
And all my doings I put in print,
On every Saturday eve.
I've no muscle to weary, no breast to decay,
No bones to be "laid on the shelf,"
And soon I intend you may "go and play,"
While I manage the world myself.
But harness me down with your iron bands,
Be sure of your curb and rein ;
For I scorn the strength of your puny hands,
As the tempest scorns a chain!

IMPROVED CORN SHELLER.

Figure 1.

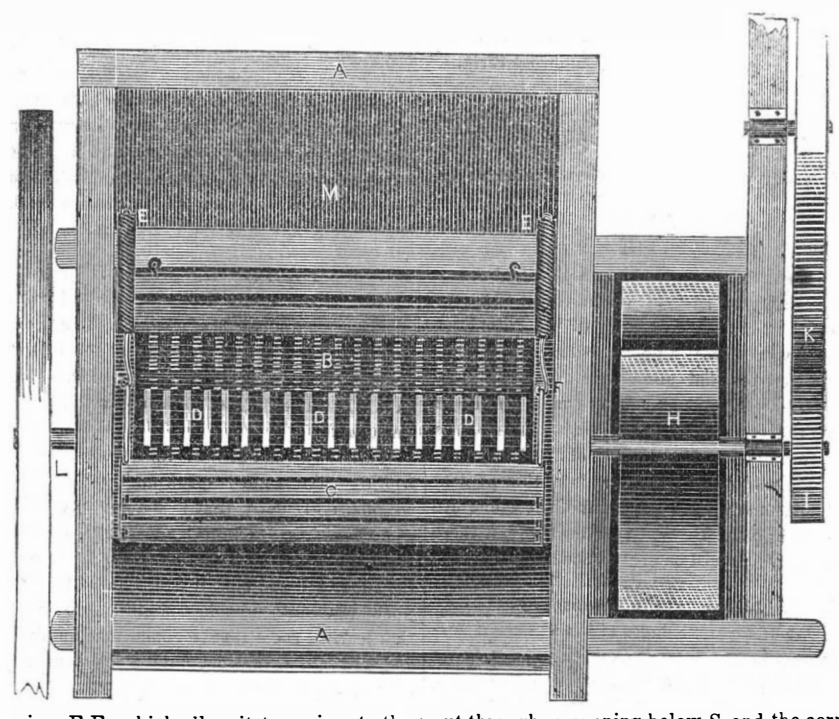


This Machine is the invention of L. M. Whitman, and is now the property of S. G. Wise of Weedsport, Cayuga County, N. Y. It possesses the property of shelling corn with wonderful rapidity and cleans the grain by removing all dust &c., by a blower at one operation.

Fig 1, is a perspective view and fig, 2, is a vertical section, that is, as viewed looking down upon the top of the machine, only the frame P. in fig. 1 is omitted in fig. 2, to shew the parts to better advantage The same letters in both figures refer to like parts and the reader must refer to both in perusing this description.

A, is a frame made in the usual form or of any other more suitable. B is a concave bed made of cast iron plates, with projections on their inside surfaces. D, is a cast iron cylinder having projections cast on its outside surface and by the ears of corn being fed in between the roller and the concave bed through M, on the other side of the lid R, and the cylinder set in motion, the ears will be carried round between the cylinder and concave bed and all the corn removed from the cob in a most excellent manner, and when it is carried round to the rake teeth seen above D D, the cob is thrown over the frame P, and falls over the side of the machine. The concave bed is hung on strong springs E E, which allow it to spring to the various sizes of the ears of corn—making it flexible for that purpose. The plates C, which form the concave bed are placed a small distance apart from one another, so that the corn falls down between them into an inclined conduit which carries the corn below H, a revolving set of fans, where the grain is perfectly cleaned by the dust &c. being blown out through an opening below S, and the corn being heavier passes into the granery or recepticle out of the opening T.

Figure 2.



OPERATION.—The ears of corn are placed in the hopper M, best seen in fig. 2 and the master wheel K is turned, which driving the small cog wheel I, turns the revolving cog surface cylinder D, and carries the ears of corn between it (the cylinder) and the concave bed B, when, by the action of the rough surface of the cylinder and concave bed upon the ear of corn, the grain is effectually removed from the cob, as the ear is carried from one side to the other of the concave bed. And by the concave bed being attached to springs, it will be observed, that according as the ears are great or small, and also as they get smaller in their progress of shelling, that the exact relative distance to remove the corn from the cob will be maintained between the revolving iron cylinder and the concave bed.

This is a very important and valuable part of the invention. It shells out the corn in great style, and its work is both clean and satisfactory. Measures have been taken to secure a patent.

RAIL ROAD NEWS.

Rochester and Lockport Railroad.

The work of preparing the way for the Railroad from Rochester to Lockport, has been commenced in the vicinity of Albion and Medina. There have been many difficulties with which the Directors have had to contend in forwarding this enterprise ; but we are informed that they are nearly all surmounted, and that the work will proceed without further delay, to its final completion.

Northern Line.

The Railroad from Troy to Whitehall, by Saratoga, is expected to be completed in about four weeks. This link in the chain of communication between Montreal and New York is much needed.

East Tennessee and Georgia Railroad.

The Board of Directors of the East Tennessee and Georgia Railroad have contracted with Gen. Duff Green, acting for himself and several northern contractors, to complete and equip the road from its southern terminus to Knoxville. They will soon commence on the line of the State road, and is to be completed to the Hiwassee River by the 1st of July 1850, to the north-bank of the Tennessee, including the bridge, on or before the 1st of March, 1852 ; and to Knoxville by the 1st of March, 1853.

The bridge over the Tennessee is to be completed by the time the road reaches the river, at a price to be agreed upon hereafter, and the first clear profits of the road are pledged to meet the claim for its construction. The contractors are to receive (exclusive of the cost of the bridge over the Tennessee) $1,850,000 for building and equipping the road to Knoxville. Of this they agree to take $1,150,000 in stock in the road, $200,000 in state bonds (which amount, it will be recollected, must be issued by the State to complete the payment of her original subscription) and $50,000 in company bonds or cash at the option of the company.

Red River Railroad, Texas.

A Railroad meeting was held in Huntsville on the 20th ult., Hon. Sam. Houston in the Chair, and A M. Branch, Esq. Secretary. The meeting was addressed by Col. Allen, and resolutions were passed approving of the plan for the construction of the Railroad from Galveston Bay to Red River. Col. H. Yoakum and J. C. Smith were appointed agents for receiving donations of land in accordance with the terms of the project.

The Zoophyte.

The zoophyte occupying the lowest place in animated nature is widely scattered through the seas of the torrid zone, each species being confined to the district best fitted for its existence. Shell-fish decrease in size and beauty with their distance from the equator ; and as far as is known, each sea has its kind, and every basin of the ocean is inhabited by its peculiar kind of fish.

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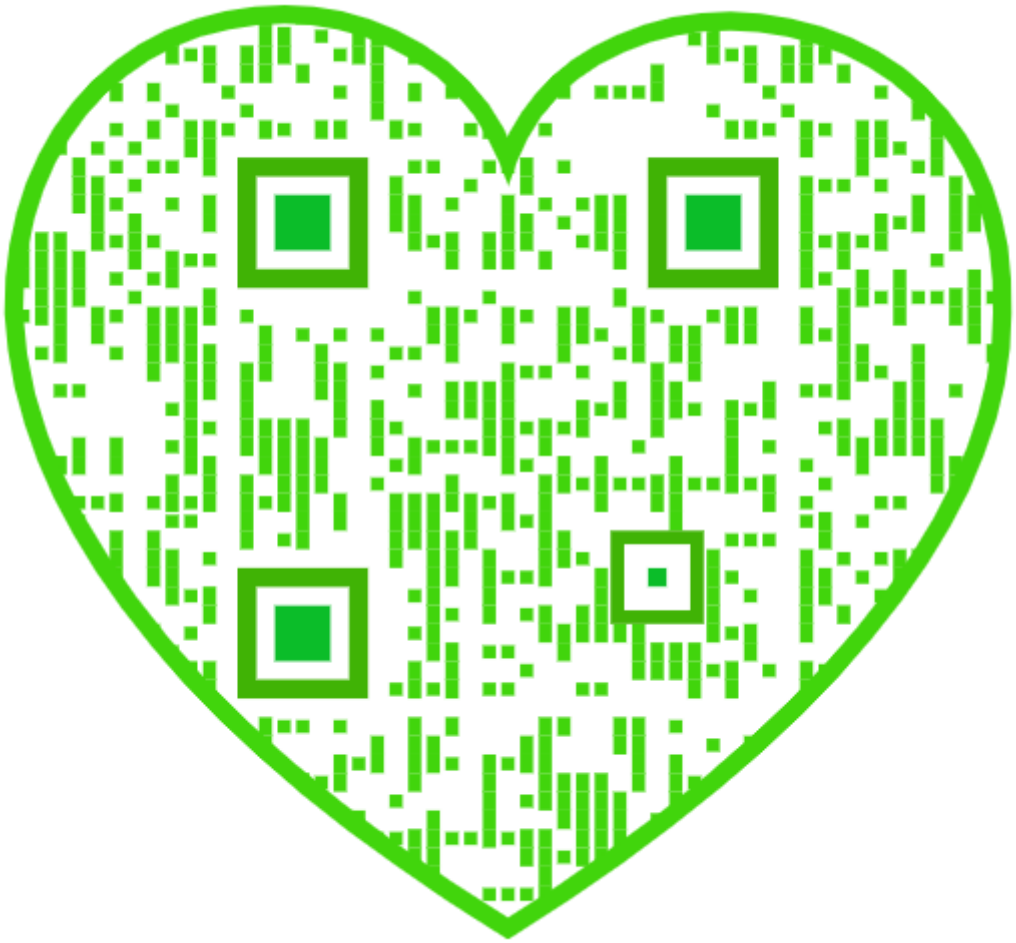

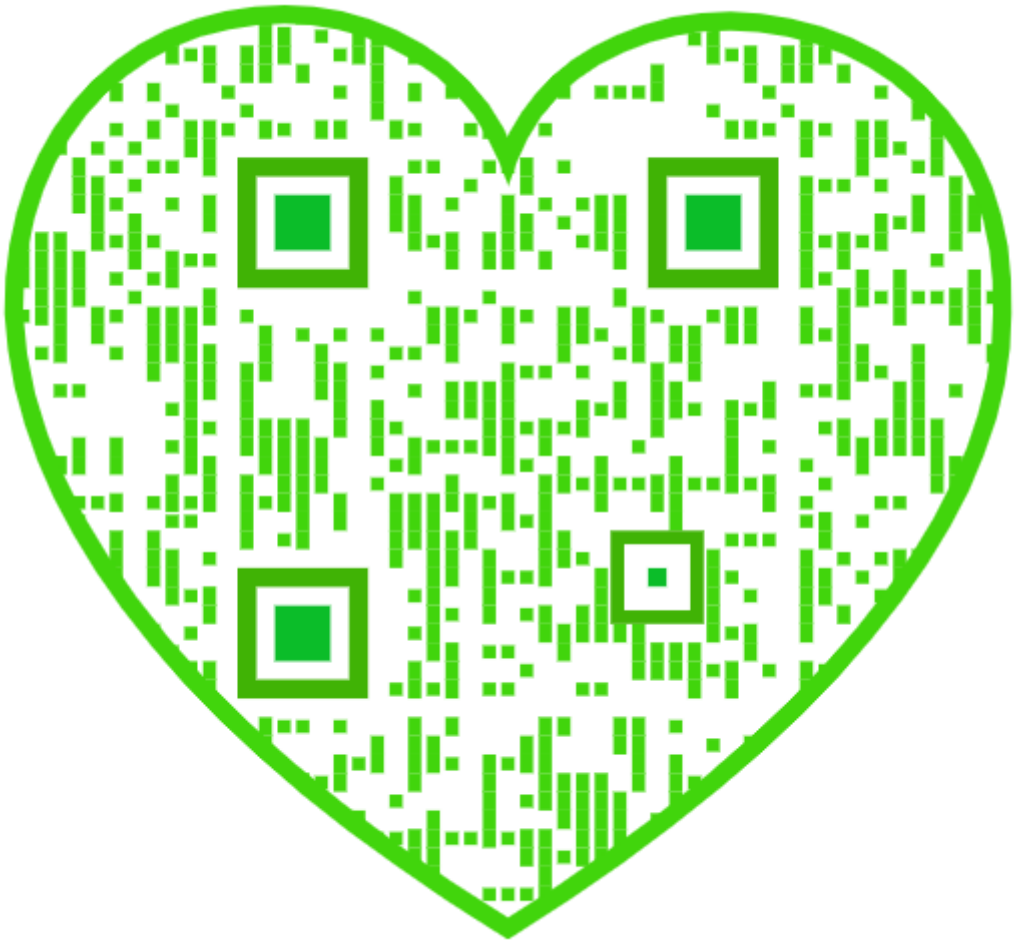

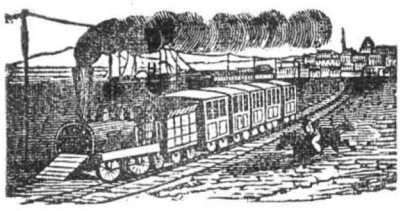

The Fair of the American Institute.

No. 9.

PREMIUMS AWARDED.

SILVER MEDALS.

E. G. Alden, Boston, Mass for best Lard Oil.

John Vandeventer, 87 Barclay-st. for best Paste Blacking.

Josiah Macy & Sons 189 Front-st for Refined Sperm Candles and a beautitul specimen of Patent Sperm.

Union Whitelead Manufacturing Co. Brooklyn, for very pure Dry White Lead.

John Johnson, 115 Broadway, for best Brass Bedstead.

J. B. & W. Cornell, 153 Centre-st. for best Wrought-iron Bedstead.

George W. Stillwell, Brooklyn, for best cast iron Bedstead.

Batchler & Bensel, 101 Reede-st. beautiful cast-iron Enameled Tables.

Horatio Allen, Novelty Works, N. Y. for best Sofa Bedstead and Tables.

H. W. Kingman, 438 Pearl-st. for best Sofa Bedstead.

F. French, 475 Broadway for best Extension Tables.

John Massy, 215 Bowery, the best Invalid Bedstead.

Jacob Stuzer, 80 Nineteenth-st. best Caned Chair Seats.

Joseph Bradley, 317 Pearl-st. for best gilded and inlaid Chairs, (inlaying done by G. A. Backus) 144 Fulton-st.

Thomas Brooke, Brooklyn, for best Rosewood Parlor Chairs.

Finn & Brothers, N. Y. for a new mode of constructing Parlor Furniture.

John. F. Genin, 214 Broadway for best Silk Hats.

Gault & Bigelow 120 Maiden-lane, for best Otter Caps.

Wildman, Stone & Co. Danbury, Ct. for fine water proof white Wool Hat.

J. W. Griffiths, 616 Pearl-st. for best model of Ocean Steamers.

Smith & Dimon, N. Y. for best model of Clipper Ship.

S. P. Wyckoff, 304 Fourth-st. for best model of Yacht.

J. F. Andrews, Boston, Mass. for best Steam boat Steering Apparatus.

D. W. Canfield, ½ Maiden-lane for best Ready Made Linen.

Mrs. Mary Stangman, Brooklyn, for best Worsted Worked Chairs.

Mrs. B R. Voorhies, Montgomery Co. N. Y. for display of domestic Manufactures.

John Bruce, for superior finished Copper and Steel Plates.

R. H. Towner, 306 Pearl-st. for the best Hair Seating, by power loom.

D. R. Greenough, Clinton-st. for a model of a Balance Dock.

J. H. Butterworth, Morris Co., N. J. for a superior Bank Lock.

John Mayher & Co. 195 Front-st. for 2d best assortment Agricultural Implements.

Steamboats Lost on the Mississippi.

The Cairo Delta of the 9th inst. contains a list of the steamboat disasters which have happened on the Mississippi River, amounting in all to 251 ; by which it appears that 167 boats were sunk, 79 burnt, and 5 blown up.—The Delta says it is indebted for the list to the officers of the steamer Saint Paul, who prepared it expressly for that paper. Estimating each boat and cargo destroyed at $20,000, the total would be $5,000,000. The probability, is however, that the loss greatly exceeds this sum, and many of the boats were of the first class with full and valuable freights.

Curious Surgical Case.

A child a short time since in Newburg, Canada West, fell and received a large wound in the head through which the brains protruded. A portion of the brains were cut away by Dr. Cary, in all about 3 ounces, and strange o tell, the child has survived and is now well.

LITERARY NOTICES.

Elements of Chemistry and Elements of Geology.

Two neat volumes with the above titles, being Chambers Educational Course, have been laid upon our table as published by A. S. Barnes & Co. No. 51 John st. this city. This edition of the two works in question has been enlarged and improved by Dr. Reese M. D., LLD. The works need no recommendation for merit—their fame is world wide. We solicit for them a wide circulation for they are worthy of it. Every young man should have these volumes in his possession. They are standard works, permanently useful. These are the kind of books we like to recommend —because they are instructive and beneficial.

Sartain's Union Magazine.

From the January number of the Union Magazine formerly published in this city we notice the name of Sartain prefixed to its title as above, and that the publication office has been removed to Philadelphia. We know not the cause of this move nor in what manner Mr. Sartain is connected with its publication, but we are confident that his name alone will bring it thousands of new subscribers. Mr. S. is the best mezzotint artist in the country—and if the subsequent numbers maintain the improvement which the January No. possesses over former ones, the work must succeed. Dewitt & Davenport Agents, Tribune buildings, N. Y.

Berford's World as it Moves.

The first number of this weekly Magazine has been laid upon our table. It is a Magazine originated by Mr. Berford, No. 2 Astor House, who in admiration of the heroic conduct of Frederick Jerome, the sailor, has made him a partner in the work.

This number contains a short biography of the daring sailor, which will be found interesting. The contents are varied and good, the most curious and interesting of which is an article from a recent work of Dr. Davidson of N. J. on Bodily Agitations (Religious Extravaganzas) in Kentucky. This Magazine will be issued weekly at No. 2 Astor House, it contains 40 pages of closely printed matter and is only 12½ cents per number, and it has already arrived to a great circulation.

Moneypenny, or the Heart of the World.

An interesting romance of the above title has been laid upon our table and from a hasty perusal of its contents we are inclined to recommend it as an interesting and amusing story. It represents in a faithful manner the upper and lower walks of New York life. Illustrated—price 25 cents. Published by Dewitt & Davenport, Tribune buildings.

The Prairie Farmer.

This is an Agricultural Magazine published monthly by Messrs. John and Amhrose Wright, at Chicago, Ill. which deservedly ranks high among our Western farmers, not one of whom in all Illinois should be without it.

Statistics of Metallic Manufactures in France.

The number of French locomotives in France in 1842 was equal to that of those manufactured in foreign countries ; in 1843, there were 2 more ; in 1844, 44 more; in 1845, 76 more ; in 1846, 161 more. In the latter year there were 273 steamboats belonging to private persons and companies, sea-going and navigating the rivers. There were employed in France, in 1846, 4,395 steam engines, of a force equivalent to the power of 2,097,025 men.

It is calculated that there is at this present moment more than one third of these engines in *statu quo*. By next year however, if there be peace, all will be prosperous again.

Labor Saving Machinery.

One of the advantages of labor saving machinery is that not only is work done with far greater rapidity, but is infinitely better done, and much easier done. Is a plain surface required ? the machine furnishes it better than man can with all his skill. Is a shaft required the sliding lathe shall present it, perfect, in all its proportions.—Is an immense cylinder required to be bored out exact in its dimensions, the machine with scarcely the intervention of a master accomplishes the task. The machine shop has its wonders and beauties, visible only to the eye of the initiated.

Steam and Charcoal Kilns.

Messrs. Editors —I noticed in the Scientific American an account of a patent taken out in England for cooling coke and charcoal in kilns. The Hammonds, at Crown Point, eject steam into their kilns for this purpose, and it is said to good advantage. My son made a tin tube for them to convey steam to the kiln.

I would also state what may seem new to some of your readers, viz. that slacked lime flung into a spring or pool brings *frogs and fish to the top of the water.* Mr. George Farnum, of this town, caught 412 frogs at one time last summer, by this process.

Clark Rich.

Shoreham, Vt. Nov. 1848.

[The employment of slacked lime to destroy fish in streams, is known to many. There are penal laws in Britain and Ireland against its use for this purpose. The small beautiful yellow frog does good to springs instead of injury, as it lives upon worms, &c., but all wells should certainly be treated to some slacked lime every summer, to destroy the hideous black frog, &c.—Ed.

Adams' Steam Guage Cock.

We hereby publish the certificate of several gentlemen respecting Mr. Adams' Steam Guage Cock, an engraving of which we published in the Scientific American of last week.

" We the undersigned, having examined the improved Water Guage for ascertaining the height of water in steam boilers, invented by John Adams of the city of Rochester, N. Y., are decidedly of the opinion that it is far superior to any thing of the kind now in use and must eventually be universally adopted.

John Hebard, official inspector of steamboats for Buffalo ; S. T. Newhall, engineer of steam boat Empire State, from Philadelphia ; Wm. Wingart, engineer of steamboat Michigan ; M. Diffanlaugh, engineer of steamboat Baltimore ; John Finney, engineer, Buffalo ; C. H. Waterhouse, do do ; Clark Wiley, engineer, Philadelphia ; Wm. E. Cooper, engineer, Lockport.

A Suspension Bridge over the Mississippi at St. Louis.

The project of bridging the Father of Waters might at first seem a little extravagant, but such a thing is positively practicable, and Mr. Ellet, who has already succeeded in connecting opposite shores under as great difficulties for the purpose of facilitating travel and business, now proposes that applications shall be made by the citizens of Missouri and Illinois during the next Legislature to procure a charter to construct a suspension bridge over the river at St. Louis. He proposes that a cheap bridge supported on wooden towers, but of ample strength and width to withstand the weights to be borne, or the gales to be resisted, can be first built and successfully used for many years ; and then, when the inclination of the shareholders, or the accumulated profits of the work will justify it the wooden towers may give place to stone, and a more extravagant structure supersede the first, with but little waste of labor or valuable material, and without any intermission of the travel.

The Telonkonphonon.

This is the scientific name applied to a speaking trumpet made of gutta percha and exhibited before the last meeting of the British Association at Sawnsea, Wales, by a Mr. Whishaw. It was exhibited as a tube or speaking Telegraph.

We have no doubt but that Gutta Percha would make a good speaking trumpet, but, we positively deny that it is a new invention of a *speaking* Telegraph, although plastered with the name of Telonkonphenon. Speaking tubes are old and it is a consolation for poor ignorant mortals sometimes to know that learned societies are sometimes humbugged with old inventions having new names, like an old veteran with a new wig.

We learn from the Boston Advertiser that the King of Denmark has directed the Comet Medal, founded by one of his predecessors, to be awarded to Miss Maria Mitchell of Nantucket, for her discovery of the telescopic comet of 1st of October, 1847. This is the first instance in which the Comet medal of the King of Denmark has been awarded to a lady.

The Onondaga Coal.

The Syracuse Journal of the 28th ult., has an article on this subject from which we extract the following :

"Instead of finding massive pieces of Coal, it appears to be only a thin strata of what is supposed to be anthracite, and imbeded in such rocks as could not have been formed without consuming its elementary combustible material. We believe it is a fixed fact that where there is an abundance of lime and sulphur as the component parts of the rock formation, Coal cannot be found, except in very inconsiderable quantities. We therefore did not give currency to those statements, and particularly after having been informed that this is not the first time the discovery has been made. Should Coal be found in Camillus to any extent, the scientific world will find a new and ample field for study ; and Onondaga County would derive more profit from it than any other county in the State. Indeed, the whole State is interested in the result, yet with but little foundation for public expectation."

Millet.

The American Journal of Agricultural Science, for September, contains an article by Professor Emmons, on the cultivation of Millet. The larger millet is much cultivated in some parts of Europe. Germany for example, where it is seen in the markets, prepared by separation from the husk, in the form of beautiful grains, perfectly round, of a golden color. It is used in soups, and, boiled by itself with water, it forms an excellent and very wholesome kind of hominy. Professor Emmons has subjected millet to an analysis in order to determine the portion of nutritive matter it contains. He finds that "compared with wheat or Indian corn, except in oil, it exceeds both in its power of sustaining life." The grain is "rich in the elements which produce bone and muscle, and its straw is not deficient in the elements common to the cultivated grasses." He thinks it might be cultivated in this country with profit as food for animals, as it yields from sixty-five to seventy bushels to the acre.

Wages.

A correspondent of the London Observer states it as a fact that, for several seasons, Mr. Macready received £100 and £120 a week in London ; and that lately, at a minor theatre, he was paid the ruinous sum of £70 a night ; that at another theatre it is said that £200 a week was last season paid to two performers, which is a larger sum than is given to the commander-in-chief of an army, the Lord Chancellor, the Chief-Justice of England or the Prime Minister.

So goes the world. A first-rate play-actor will receive for one night's service more than a hard-working laborer can earn in a year, any quantity of glory and adulation thrown in to boot ; and a Jenny Lind will exchange her dulcet notes for bank notes, by the hundred per diem, while the daughter of toil can with difficulty keep soul and body together, by plying the needle from early morn till midnight. There are many wrongs to be righted in this world, before the good time coming, of which poets speak, will appear.

But whosoever maketh wrong should be slow to complain of others.

Rebuilding of the Temple.

A Jewish Rabbi from the city of Jerusalem is now in New-York soliciting funds to aid in building a magnificent synagogue, or in rebuilding the temple at Jerusalem, the Turkish Sultan having given them the authority to do so. On Thanksgiving day, the subject was presented by M. M. Noah to the consideration of the synagogue in Crosby-street.

Convention of Cotton Planters.

The Charleston Mercury, Augusta Constitutionalist, and other Southern papers, are endeavoring to get up a Convention of Cotton planters, to take into consideration the depressed condition of the great staple of the South.

In the last number of the London Medical Times, in an article on the reappearance of the scurvy, and alluding to its having been on board the Raritan, Potomac, and Falmouth, while operating in the Gulf. It says the American nation should demand the dismissal of the medical staff connected with our naval service.

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The Electric Telegraph.

No. 7.

The Electric Chemical Telegraph, is radicallydifferent from that of the Electro Magnet Telegraph. It is not operated by electro magnetism—no magnet is used about the whole apparatus. The principle of it consists in having a strip of prepared paper pass over a roller, on which rests a steel pen, and as the circuit is closed and broken, there will be light and dark marks made by the pen on the prepared paper, and these marks are the letters of any message sent along the wire formed by the operation of breaking and closing the circuit. The philosophy of this operation, consists in having the paper prepared with a solution of the ferro cyanate of potass and nitric acid, and the marks of the steel pen are formed by a decomposition of the iron by the electric current where the pen and prepared paper comes in contact, and consequently a new combination is the result, which is the cyanade of iron—a blue color. The prepared paper for the electro chemical telegraph could be made another way, but the above is sufficient to show its nature. It is a kind of calico printing. The first patent that was taken out for a telegraph of this kind was Mr. Davy of London in 1838. His invention was not a practical one, and consequently was never used. In 1843 Mr. Alex. Bain took out a patent for a very important improvement on Davy's in fact first made it of practical worth. In 1846, Mr. Bain took out another patent for a valuable improvement and his machine as improved, at least for an Ocean Telegraph, transcends every other that has been constructed A full description will be found with engravings on page 273, Vol 3 Scientific American. We have now said enough to point out the difference between the *deflective*, the *magnet*, the *printing*, and the chemical telegraphs.

The science of electricity, as applied to telegraphing, is but in its infancy. As a public conveyancer of news, it is a young, but an intrepid and swift mail carrier. It will yet in a great measure supersede the letter bag, and consequently every improvment to render it more available to the public, is of great importance.

The first telegraph patentee in Britain and the first telegraph patentee in America have sturdily opposed every other inventor in the same field. This is human nature—frail and selfish Two of the Examiners in our Patent Office, have been blamed for being interested in opposing the claims of every telegraph inventor but those of Prof. Morse, and circumstances seem to give just ground for complaint in this matter. The circumstances to which we specially refer, are the late transactions relative to contested claims of Bain and Morse for the Electro Chemical Telegraph—to every disinterested person who has paid attention to the matter in dispute, and to the evidence adduced on both sides, the claims of the former have not had fair play, for the whole world almost has had occular demonstrations of the fruits of his invention, while the claims of the latter have to be sustained by dim proofs.

We have read the letter of Henry O'Reily to Prof. Morse concerning the attempted *Telegraph Monopoly*. It is caustic and severe. From his letter it would appear that he has been ill-used by the Agents of Mr. Morse, but as this is a business controversy (but a very important one to the public) we will not say a word about it until it is settled at law. We have only been discussing different principles of secured telegraphs, and we will always advocate the just rights of the inventor, as viewed by us, without partiality and without fear. From the evidence which we have gathered together respecting the claims of different inventors, we believe that there are three telegraphs now before the people of the United States, totally different from one another, and separately the inventions of different inventors. The one is the Electro Magnet Telegraph of Mr. Morse; the 2d is the Printing Telegraph of Prof. House, and the third is the Electro Chemical Telegraph of Mr Bain. Every one of these telegraphs is enough to confer scientific distinction upon their authors.

We have read the controversy in the Tribune between Morion and Mr. Page, Examiner in the Patent Office. Like all other controversies it is too personal and Mr. Page has given us cause of regret in using a term to designate a stranger, who has come to this country with character the most upright, and whose works as displayed in this city, place him in the front rank of inventors and mechanicians

For the Scientific American.

Blanchard's Gun Stock Machine.

Messrs. Editors.—In your valuable journal of November 25th, I find noticed a trial which recently occurred in the United States District Court, held at Philadelphia before Judge Kane for an infringement of Blanchard's Patent Gun Stock Machine. In that notice you say. "We wish to be impartial and we wish to see the true inventor protected. We will be glad to publish the views of Mr. Blanchard's friends and really wish that we could publish the evidence adduced at the late trial" In reply to this kind offer I would state that as soon as this important case is finally decided, it is my intention to publish not only the evidence adduced at the trials, but also the able and conclusive charges of Judge Kane which contain an enunciation of the most important principles involved in patent cases.

A publication of this nature while the matter in dispute is still before a legal or equitable jurisdiction, and while numerous other suits are pending in the several Circuits both in equity and law, seems to me scarcely justifiable; and however much benefit might be derived from such a course I shall not follow a bad example but will defer the opportunity offered of fully vindicating to the Scientific world the originality of Mr. Blanchard's invention until the final decision of these cases. At present I am at a loss to know to what extent the Jury were influenced by statements foreign to the Court or witness stand; but in my opinion other circumstances than the evidence given at the Trials had an important influence in producing the disagreement of the Jury empannelled. You were misinformed as to the point that the Judge charged the Jury with regard to some articles published in the Scientific American. During the course of the trial he simply cautioned the Jury against published articles, without however naming any publication and this no doubt gave rise to the reports which reached you. The result of these trials has clearly shown the inefficiency of our present Patent Laws when they are invoked to protect the rights of the Patentee. For thirty years has Mr. Blanchard been obliged to contest against those who were continually under some pretext or other infringing his Patent and he presents the singular spectacle of having always established his right before a legal tribunal, and yet his expenses incurred in establishing these rights have been greater than any income derived from the same. This threatens to continue as the same defences are set up in new cases which have been decided worthless in old adjudications. Under our present laws jurors not only consider themselves judges of facts, but assume the province ot the Court and venture to decide upon doubtful questions of law. Step by step the true inventor is losing all the benefits which should be derived from the triumph of his labor and skill, and is placed at the mercy of those who are possessed of ample means to pursue a long contested legal suit. With regard to the publication of the evidence I would state that it has been reported in full in several cases which is now in my possession, and the same course will be pursued at subsequent trials. To such an extent as this evidence and the decisions founded thereon, may be considered by you valuable to your numerous readers, I shall at some future period avail myself of the privilege of your columns. This will be done however not so much for the purpose of vindicating the originality of Mr. Blanchard as an Inventor (for that has been adjudicated before the ablest jurists of the country) as to demonstrate the improper means which have so long delayed the final settlement of these questions.

Amos K. Carter.

Newark, N. J. Nov. 27th 1848.

In answer to Mr. Carter, we will be happy to publish the evidence and opinions mentioned in his communication, and after this we will not publish any article relative to Mr. Blanchard's invention until the cases that are now before the courts are decided. Honor and truth are the planets that direct our course in conducting the Scientific American.—Ed.

For the Scientific American.

Messrs. Munn & Co.—In the trial between the Blanchard Gun Stock Co. against Brown, Eldridge, and others, the Jury, as in a former case, were unable to agree.

The question turned upon the respective claims of Azariah Woolworth and Thomas Blanchard to the invention; whether it was simultaneous with both or whether Blanchard was the original projector and inventor.

This is the first time the two claimants have confronted each other upon the witness stand; Mr. Blanchard having disposed of his entire interest the day previous to his appearance in said capacity for the purpose above stated.

The case as yet remains undetermined by reason of the discharge of said Jury. Both parties have received patents.

Very respectfully yours, &c.

J. B. Eldridge.

Philadelphia, Nov. 25, 1848.

A Singular Rock.

There is near Stoney Brook, Morris county, N. J. a huge rock lying on the mountains in a curious position. The stone is a boulder about 20 feet in length, 14 in breadth, and of a tabular form, with average thickness of 7 feet and weighing consequently about 150 tons.

But it is not the mere size and weight of such a stone removed by some unknown agency from its original bed, that gives it its interest; there are many such, and of even larger size, that lie scattered about the mountains. It is its peculiar position. It lies on three large stones of rounded form, and elevated above a piece of flat inclining rock from 2½ to 3 feet and making under it an open space where one may find the cooling shade or protection from the shower. The rock rests its almost entire weight on two of the stones placed in a line nearly across the centre, and the spaces on which its great weight depends is in the one case 10 inches by 2, and in the other 5 by 6 inches. The third stone seems but to serve the purpose of keeping up the balance of what it preponderates on one side and here it rests upon a point only an inch in diameter.

So nearly is this rock balanced, that one with a good lever, properly adjusted, can move it; and thus by overcoming a difference in the balance equal to about 2 tons can move the whole 150 tons. What is a little singular, there are near by it three other large rocks resting in part on smaller stones, although not elevated like the former.

The Largest Scythe Manufactory in the World.

The largest scythe manufactory in the world is in the State of Maine a few miles from Hallowell. It belongs to Reuben Dunn, Esq., a very enterprising gentleman. The establishment consists, besides warehouses, furnishing shops, &c., of three principal buildings for manufacturing, two of which are one hundred and forty-four feet each in length. In these, and in departments connected with the establishment, are employed about one hundred men, many of whom have families settled at the place A flourishing village has grown up within a few years, and is rapidly increasing.

Twelve thousand dozen scythes are annually manufactured, to produce which are required 450,000 lbs. of iron, 75,600 lbs. of steel, 1200 tons of hard coal, 10,000 bushels of charcoal, 100 tons of grind-stones, and half a ton of borax. The last article is used in the process of welding.

The proprietor has been at great pains to manufacture a superior article, and no scythe is permitted to go into the market till it has passed the ordeal of two experienced and careful workmen, besides the examination of the general superintendent, whose inspection extends to every part of the establishment.—This care has given these scythes a celebrity which secures a ready sale for all that can be furnished.

Mr. Dunn is erecting additional works in the vicinity, which will soon be completed, when he will be enabled to turn out 17,000 dozen scythes annually.

Rapid Motion and Sound.

The following article by Mr. Scott Russell and published in the London Athenæum, will be found of considerable interest to many of our readers.

Until the existence of the very high velocities now given to railway trains, no opportunities have existed of observing any phenomena, in which the velocity of the observer has been sufficient to affect the character of sounds. The author, having had occasion to make observations on railway trains moving at high velocities, has been led to notice some very curious effects in sounds heard at 50 and 60 miles an hour. These effects are not heard by an observer who is stationary. He found that the sound of a whistle, on an engine stationary on the line, was heard by a passenger in a rapid train to give a different note—in a different key from that in which it was heard by the person standing beside it. The same was true of all sounds. The passenger in rapid motion heard them in a different key, which might be either louder or lower in pitch, than the true or stationary sound.

The explanation of this was given as follows:—The pitch of a musical sound is determined by the number of vibrations which reach the ear in a second of time—32 vibrations per second, of an organ pipe, give the note C, and a greater or less number give a more accute sound, or one more grave. These vibrations move with a velocity of 1024 feet per second nearly. If an observer in a railway train move at the rate of 56 miles an hour, towards a sounding body, he will meet a greater number of undulations in a second of time than if at rest, in the proportion which his velocity bears to the velocity of sound; but if he move away from the sounding body, he will meet a smaller number in that proportion. In the former case, he will hear the sound a semi-tone higher, and in the latter a semi-tone lower than the observer at rest. In the case of two trains meeting at this velocity, the one containing the sounding body, and the other the observer, the effect is doubled in amount. Before the trains meet, the sound is heard two semi-tones too high, and after they pass, two semi-tones too low—being the difference of a major third.

There were next explained, the various effects which the noises of a train produced on the ears of passengers at high velocities. The reflected sounds of a train, from surfaces like those of bridges across the line, were at ordinary velocities, sent back to the ear changed by less than a semi-tone, so as to cause a harsher discord, which was an element of the unpleasant effect on the ear when passing a bridge. In a tunnel, also, the sounds reflected from any irregularities in the front of the train, or behind it, were discords to the sounds of the train heard directly. He showed, however, that, at a speed of 112 miles an hour, these sounds might be those of a harmony with each other, and become agreeable, for the sounds reflected in opposite directions would have the interval of a major third.

Sir. D. Brewster observed, that in his opinion, the explanation of the curious effect of rapid motion of the observer on sound, was to be sought from physiological causes, and not acoustic; and pointed out what he considered to be analogous phenomena with respect to light—such as the augmentation of light at the boundary of moving shadows, the perfect clearness with which objects could be seen through rapidly moving openings in screens, and the production of color by screens in motion under certain circumstances.

Sir. W. S. Harris conceived that all the effects were to be explained by the undulatory theory of sound, in the manner in which they were explained by Mr. Scott Russell.

Building Societies.

Building Societies appear to be quite popular in Canada. A loan meeting of the Upper Canada Building Societies was held at Toronto a few weeks ago, when shares of the stock were sold at the average bonus of 58 1-4 per cent. The shares of the Niagara District Society sold on Monday last at an average bonus of 45 per cent. These Building Societies are calculated to effect much good in affording aid to those who are otherwise unable to procure the means for the construction of dwellings and the purchase of homesteads.

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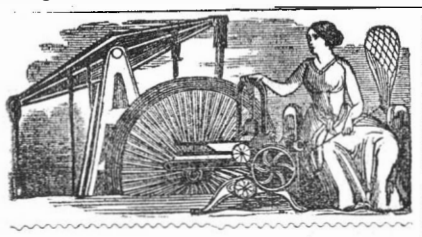


New Inventions.

New Railroad Brake.

Mr. A. McQueen, machinist, of Fall River, Mass. has invented a new kind of Railroad Brake, which it is believed will supersede those now in use. It is simple and safe, and will afford a great saving of repairs. It is immediate in its action, and of sufficient strength to easily withstand and overcome the momentum of a train of cars under a velocity of 30 miles per hour in the almost incredible short distance of forty feet. It can be applied to any of the trucks now used, but were the trucks made according to the directions of the inventor, the cost would be less by 30 or 40 per cent on the whole truck. As the above invention is of the utmost importance with regard to the safety of railway travelling, the inventor says he is now prepared to assign the same to any one now in the business of car and truck building, or any one who may wish to carry it into effect, who will get more information by addressing him, post paid, according to the above direction.

Ingenious Lock and Key.

The Philadelphia Ledger says: "We yesterday saw exhibited in the Reading Room of the Exchange, by Mr. Evans, a very ingeniously constructed combination door lock, for banks, stores, &c., the invention of a young German. One of the principal peculiarities of the invention is the key, which is so made as to be changed by a gauge belonging to it into a variety of forms, with either one of which the lock may be locked, but can only be unlocked by the key in the same form as that in which it locked it. The invention is an ingenious one, to say the least of it; whether superior to others now in use, we do not consider ourselves qualified to judge."

The Polishing of Telescopic Specula.

Mr. Lassell, of Liverpool, whose astronomical observations and discoveries have won him a high place amongst British astronomers of the present day, in a letter which is given in the last faciculus of the Royal Astronomical Society, states that he has at length brought his polishing machine to do all he ever proposed or hoped it would do. He says he is now able to repolish a known good surface without hurting it, and to turn a bad one into a good one with certainty and expedition. By certain rules, varying with the proportion of the focal length to the aperture, he can produce a parabolic surface, which shall have the same focus in every part of its surface, to the hundredth of an inch. He adds that the improvement of regularity of curve is not less than in the truth of its general form.

If this is positively a fact, it is one of the most important discoveries ever made. The parabolic surface is the grand desideratum of astronomers.

New Electrical Light.

The inventors of a new electrical light, exhibited at the Western Literary Institution, Leicester-square, London, on its recent reopening under the new auspices, expect, it is said, to apply it generally to shop and street illumination; and they state, that while the conveying will cost no more than gas, the expense of illumination will be only one-twelfth of the price of the latter light. The current of electricity in passing through the two pieces of charcoal which form the poles of the circuit, and are excluded from all access of air, gives, in this case, it is said, an intense and beautiful white light; with the effect of daylight to a much greater extent than the lime does, and having this advantage, that it is sustained and continuous. If Messrs. Staite and Petrie can thus produce a steady and sustained light, they have accomplished what has hitherto been the sole preventative to the substitution of galvanism for gas. The Mechanic's Magazine states that this one light completely eclipsed ten gas lights and an oxy-hydrogen! The gas companies had better look out. The dissatisfaction of the public with their mismanagement may have begotten a rival destined to eclipse many more than merely ten of their gas lights.

Gee's Improved Self-acting Faucett.

We here present two engravings of the self closing Faucett invented by Geo. Gee & Brothers, No. 47 Eldridge st., this city. For domestic purposes, we would say, that this faucett is used with the orifice placed downwards when by pressing with the finger upon the top or cap of C, the water flows out of the faucett, and when it is wanted to be closed, the finger has only to be removed and the power of the water shuts up the opening between the inlet and outlet of the faucett.

FIG. 1.

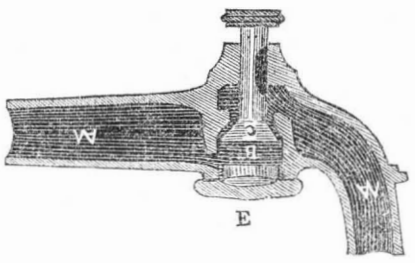
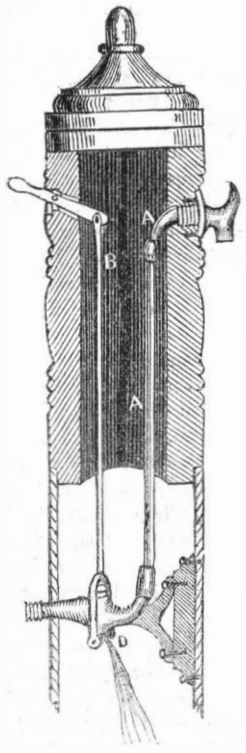


Fig. 1 has its opening of discharge placed downwards, but can be applied to a hydrant, the reason of which will be explained hereafter. W, is the inlet passage communicating with a chamber B, and to get out of the outlet, it, (the water) must pass around the solid piston C, which is shaped like the frustum of a cone. Our readers will bear in mind that the form of the faucett is circular, therefore the parts are thus formed to coincide with one another, the chamber, &c. It will be observed that the more C is pressed into the chamber, the larger will be the passage for the water to escape between it and the sides of the chamber B, but when the pressure is removed from the cap of the piston C, the water in the chamber will so press upon the face of C, which by its greater area than that of its sides will and must be pressed tight into its seat and act as a valve to close the passage that otherwise communicates with the outlet. In the stock or shaft of C, there is a small passage indicated by the dark shading. This is an opening in the stock of the piston which communicates with the outside of the faucett when the piston is in its seat and the water shut off.—Its object therefore will at once be appreciated which is to drain off the water left in the curve of the outlet tube and prevent it from freezing in cold weather. The use of this arrangement will be better understood by

FIG. 2.



This is its application to a hydrant. The reader will bear in mind that the faucett is operated as described above, but here we have the cap of the piston of fig. 1, operated by a rod which extends down in the hydrant and is connected with the cap by a bridle which passes around the faucett and pushes, or rather draws up the piston in the chamber, by pressing upon the handle of B, outside. A, is the pipe through which the water passes from the faucett at the bottom to the discharging tube near the top of the hydrant.—The piston of the faucett is now firmly pressed to its seat by the water and the communication between the inlet or main pipe and A A is closed, and, as we have explained in fig. 1, the small passage in the stock of the piston valve, is now in communication with A A, and the water that would otherwise lodge in the upright tube A A, is discharged out of the said pipe and faucett at D, so as not to freeze therein. Every one acquainted with faucetts and those who are not, will at once appreciate the merits of this simple and beautiful invention, which must ultimately be of considerable profit to Messrs. Gee, who have taken measures to secure their invention.

House for Drying Fruit.

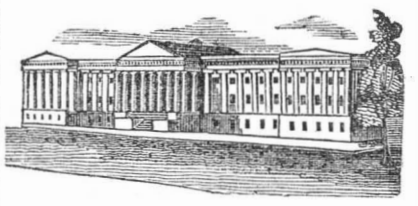
A correspondent (Silas H. Gard) of the Ohio Cultivator, describes as follows, a Kiln which he has constructed for drying fruit, which he says answers a most excellent purpose, and which we believe will be interesting to many of our readers. He says "the kiln is small and compact, is easily managed, and requires less fuel for the work performed than any other kiln I ever saw. If rightly tended it will yield six bushels of dried fruit, each morning—(if made larger of course the quantity will be greater)—it holds eighteen bushels of fresh cut fruit, and only requires the fire to be renewed four or five times in the 24 hours to complete the drying; it also dries all the shelves equally, so that the fruit can be all taken out at one time.

The plan of my house is as follows: Dimensions six feet by ten, (outside the wall,) height of front wall say thirteen feet, of back wall ten feet, with a shed roof. The furnace is fifteen inches in height and width, and extends from the arch in the middle of the end wall the length of the house inside, [built of brick, covered with flat stones we presume, Ed.] and is plastered 1 1-2 inches on top, to prevent danger of fire from cracks. On each side of the furnace a flue returns (horizontally) to the chimney, which is carried up inside the wall directly over the arch. In the side walls of the house nine pairs of cross-pieces, of 2 1-2 by 3 inch scantling, are set three bricks apart, and six inches from the walls, on which the baskets or drawers are to slide. In the upper corner of each gable end wall is a window or opening six inches square, to let the steam pass off. The walls are plastered inside, and also the roof, by lathing the undersides of the rafters. The door way is in the middle of the front wall, and is five feet high by seven feet wide; or rather it has two doors of 3 1-2 by 5 feet In front of the door way the cross pieces are moveable, (resting on those fixed in the walls,) for the convenience of putting in and taking out the drawers. The drawers or baskets are 4 feet long and two feet wide, so that each tier contains four baskets. They are made of laths 1 1-2 inches wide, nailed on three cross-pieces 1 1-2 inches square, with 4d nails. Outside the door is a platform to stand upon when arranging the fruit, from which the upper shelf can be reached. (If thought best the door way can be made the full height of the range of shelves, then you have a complete bureau kiln, with every drawer accessible with the outside). The materials required for this house, are 3,500 bricks, 12 bushels of lime, (unslacked,) 1000 laths, 125 feet (running measures) scantling, 500 shingles, 8 lbs. 4d nails, 1000 feet of plank and door frame stuff. The whole cost in this place is only 25 or 30 dollars and any farmer of common ingenuity can do all the work except the bricklaying."

Experimental Vessel.

A vessel for experiment has lately been constructed in Sunderland, England, which is a novelty there. She has no keel, but is flat bottomed. Neither is she caulked—the seams are lined with felt. She is 224 tons register, and carries 4,000 yards of canvass when in full sail; she draws only 9½ feet of water. On the run down, with a N. N. W. wind, she outstripped ten colliers.

With the exception of being lined with felt, she would be no novelty on the Hudson River.



LIST OF PATENTS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending Nov. 21, 1848.

To A. Goodman, of Dana, Mass., joint inventor with and assignee of W. Gibbs, of Prescott, Mass., for improvement in Planing Irregular Forms. Patented Nov. 21, 1848.

To M. W. Fisher, of Washington, D. C. for self-feeding machine for charging percussion caps. Patented Nov. 21, 1848.

To C. Reiffell and N. Thorn, of New York City, for improvement in Dividers or Measuring Compasses. Patented Nov. 21, 1848.

To Oliver Clark, of Brunswick, Ohio, for improvement in Scythe Fastenings. Patented Nov. 21, 1848.

To William Boone, of New Hope, Mo., for improvement in Grass Cutting Machines.—Patented Nov 21, 1848.

To David W. Seeley, assignee of George Brown, of Carlisle, N. Y. for improvement in Couplings for Axles and Bolsters. Patented Nov. 21, 1848.

To U H. Goble and A. Stuart, of Urbana, for improvement in Harvesters. Patented Nov. 21, 1848.

To John Lightner, of Roxbury, Mass., for improvement in Axle Boxes. Patented Nov. 21, 1848.

To Nathan Chapin, of Cortlandville, N. Y. for improvement in Cider Mills. Patented Nov. 21, 1848.

For the week ending Nov. 28, 1848.

To Henry Kelley, of Manayunk, Pa., for improvements in the Jacquard. Patented Nov. 28, 1848.

To Charles L. Fowle, of Boston, Mass. for improvement in Razor Strops. Patented Nov. 28, 1848.

To William K. Greene, jr. of Schenectady, N. Y. for improvement in the Jacquard. Patented Nov. 28, 1848.

To E. M. Gordon, J. S. Gordon, and W. H. Gordon, of Woodstock, N. H., for improvement in the manufacture of Potatoe Starch.—Patented Nov. 28, 1848.

To Reuben Shaler, of Madison, Conn. for improvement in Knife Polishers. Patented Nov. 28, 1848.

To John A. Bradshaw, of Lowell, Mass., for improvement in Sewing Machines. Patented Nov. 28, 1848.

To Leonard H. Field, of West Sparta, N. Y. for improvement in Cooking Stoves. Patented Nov. 28, 1848.

To David Paddach, of Pontiac, Michigan, for improvement in Mills for Grinding. Patented Nov. 28, 1848.

To Seneca S Jones, of Leicester, N. Y. for improvement in Sausage Stuffers. Patented Nov. 28, 1848.

To Henry P. Westcott, of Seneca Falls, N. Y. for improvement in machines for making Wooden Pegs. Patented Nov. 28, 1848.

To William Savery, joint inventor with and assignee of James H. Conklin, of New York City, for Design for Stove Plate. Patented Nov. 28, 1848.

INVENTOR'S CLAIMS.

Ploughs.

Iram Brewster, Stamford, N. Y. for improvement in hill-side ploughs. Patented Nov. 14th, 1848. I do not claim the revolving mould board as a new invention as that has been known before; but what I claim is, 1st, the hollow-mould board and its combination with the standard and the spiral spring. 2nd, the combination of the hollow plough point with the mould board so as to make the upper and lower sides of the mould board alike.

Roller Gins.

Jno. Schley, Columbus, Ga., for improvement in roller gins. Patented Nov. 14th 1848. What I claim is the combination of the ginning rollers and shell with the tooth feeders, constructed and operating as set forth.

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NEW YORK, DECEMBER 9, 1848.

To the Postmasters of the United States.

Gentlemen, there can be no doubt but you are all " honorable men," but you are not all perfect men. It doth happen somehow or other, that a great number of our subscribers complain with no unfeigned sorrow, that they do not receive their numbers regular and some numbers they never receive at all. Now we know that there is no paper whatever, more carefully mailed than the Scientific American Our subscribers' written wrappers are each week carefully examined by the copy on our books, before the papers are sent away. We know that the majority of our subscribers keep their numbers for binding at the end of the volume, and we know the disappointed feeling —of having *missing numbers*—making all allowance for the expression. We therefore respectfully solicit the particular attention of our Postmasters to this matter, for there is not a week passes over our heads but what some letter comes to us with *regrets* for not having received such and such numbers of the Scientific American. Where the fault lies we cannot tell, but we can tell this much, that we sent seven several numbers to the Post Office, Perrysburg, Ohio, for D. Wright, and he did not receive one of them. We might mention a great number of names, but we forbear at present, hoping that some attention will be paid to our request and that the Postmasters will see to it that the *right* persons get the *right* papers.

The Works of the Past and Lectures on the Middle Ages.

Mr. Buckingham, son of the great traveller, has been delivering lectures in this city during the past week, on the Middle Ages. We were wofully disappointed with his *facts*, but not with his enthusiasm. There are some men who are totally devoid of that strength of mind which grasps and classifies the various phenomenon that meet their gaze—men who are incapable of looking around them and making a just comparison of the works of the present with the works of the past. Of this class there are many who have distinguished themselves, not so much for the profundity of their judgment, as for the absence of it coupled with zeal and varnished with a knowledge, like a *cocoon*, which although it has a certain lustre, yet it is not the *silk* lustre. This class of beings are generally great lovers of the antique—antiquarian lore so distinguishes a man, sir. The fine classic taste you know, and all that. In their eyes, the works of the moderns are barbarous and pigmy in comparison with the works of " the ancients, so grand and sublime." If you talk to these men about the works of the present day, they will point you to the pyramids. and with a wise shake of the head, strut out their toes like the Laird of Lang Kail and carry their heads as overwhelmingly dignified as an Indian Brahmin. If you talk to one of them of the learning of the present age, there you are grounded again sir, for ten chances to one, if he dont haul out one hundred and ninety nine old illuminated manuscripts *fresh* from the cobwebs of dusty immortality and bid you gaze upon the industry and learning of the monk, to dwarf the writings of a Shakspeare or a Scott, nay, by my troth, but there is one fellow in London just now, named Dickson, who is for making *Will Shakspeare* himself, an old musty fellow of the cloister and middle ages. We do not know but what young Silk Buckingham may prove it to be a fact too, before he leaves this city. It is very difficult to tell what astonishing results may be produced by a few touches of oratorical fandango, especially upon *sensible* ignoramuses. It is very likely that about one hundred years after this, some fellow will prove, that Trinity Church was built by Dr. Wainwright or some other clergyman. It is certainly unfortunate that the monument of Christopher Wren was preserved in St. Paul's, or our lecturer on the *middle ages* might bring strong proof about its being built by Thomas a' Becket.

Law's Stave Dresser and Stave Jointer.

We published an illustrated description in our last volume of Mr. Harvey Law's Stave Dressing and Stave Jointing Machines. The descriptions that we then published were merely the mechanical construction and arrangement of the machines. Since that period, Mr. Law has received a patent for his improvements and he has brought on his machines from Wilmington, N. C. and set them in operation in Mr. Burdon's Foundry, No. 100 Front st. Brooklyn. We visited the establishment last week and had occular demonstration of their performance, and we cannot but speak highly of their merits. For working sawed staves we have seen in operation the stave dressing machine of Mr. Smith of Lockport, and three years ago we saw the one belonging to Mr. Randal in Albany, and we have likewise seen the ingenious machine of Judson & Pardee, of New Haven, Conn. for split staves ; but Mr. Law's is entirely different in its construction and operation from these, and it does its work handsomely, finishing about 8 or 9 staves per minute. The stave dresser and jointer are placed at the end of one another—as the staves leave the dresser they pass down an inclined board to the person who tends the dresser and from the commencement to the finishing of the stave the work is continuous.

In the dresser, the stave is put in under the jaws of a pressure lever, and a follower catches it (the stave) behind and pushes it through to the revolving cutters, which cut on the face and back of the stave, above and below. The cutters revolve like those in Woodworth's planing machine, but there are two set upon two axis—the one revolving above and the other below the stave. The top set are convex planes and the under set concave knives, which form the reverse surfaces on the staves. The follower which pushes the rough stave under the pressure levers to go between the knives, is carried forward by a rack and pinion and is made to operate with self-reversing geering for the forward and backward motions. The pressure levers can be set to accommodate staves of any required thickness, but the beauty of the dressing lies in planing the staves so as to suit all the most warped inequalities of the split kind. The motion of the cutters is good and the machines are not liable to get out of repair. The jointer finishes staves of all degrees of width, so that it makes no matter whether a five inch stave is first put through the dresser and then a four inch one afterwards, or not. The jointer takes them all as they come and joints the one after the other without stopping a moment. This is a very beautiful arrangement, and the *modas operandi* consists in having the finishing saw on a sliding frame, to be moved by a long lever to cut the last joint of the stave of any width desired. The followers that carry forward the staves to be jointed are dog hooks with bottom flanges fixed upon a straight travelling endless chain, but the dogs straddle on side rails and are guided by switches to carry the stave from one side to the other, from the stationary to the moveable saw to be sawed on both sides. Therefore no change of gearing is required to joint the staves of various widths. —The operator can go to the yard and take whatever staves comes to hand.

There are some improvements made on the machines since we published the engravings, and we may at some other time exhibit them by engravings—at present we speak merely of the operation as seen with our eyes, and those who are acquainted with stave dressing machines will get a good idea of both its construction and operation likewise. We hear of great complaints from Canada about bad times. If our Canadian friends want to go into a good paying business here is a machine that can whisk out their staves for London beer barrels, at no small rate, and a vessel will carry about twice the quantity of dressed that it can of undressed staves. We hope this advice will not be lost. The chips will raise steam for an engine and the expense is only in the machinery.

For Inventors to Read.

Messrs. Munn & Co.

Gentlemen.—I take the liberty to send you a few lines, partly to express my gratitude for having so valuable a paper as the *Scientific American* to read, and also to let you know that I am the assignee of a valuable invention now in the Patent Office, to run a perpendicular saw without a sash, and run a horizontal pitman. I regret exceeeingly that I did not know of you before the Patent business was put into other hands, as we have had considerable trouble already, and we are not through yet I can satisfy any reasonable person that it would have been forty dollars in my pocket if I had taken your paper from the commencement of its publication, for I spent that amount to obtain a right on a Spoke Hewer, that interfered with the planing machine, though I think yet that the application of it to getting out spokes ought to have been patented, for we have no account of its ever having been known or used as a spoke machine previous to our applying it to that purpose, and one of my neighbors is using one and he testifies it is worth $25 a year and cost $15. We have two or three more inventions in embryo, and I think we shall know where to get them patented. Every inventor ought to get you to do the business. My best wish to the man who attempts to revise the Patent Laws. They are a disgrace to any Republic, and I think that our government does not do its duty towards encouraging mechanical genius. If a poor man like myself invents any thing that does not suit the whims of the officers of the Patent Office or that may interfere with something that their friends *may* afterwards fetch in, they can, with impunity, reject it, and if the poor man knows that he is wronged and has spunk enough to appeal, he has the *cost to pay* whether it goes against him or not, as stated in sec. 63 of the Patent Laws, where they pretend to have a remedy in equity for patentees.

Your obd't. servant, G. P.

Sugar Planting in Alabama.

The Mobile Register says that the planters in the interior of that State are beginning to perceive the evils of the present system of raising cotton to the exclusion of everything else, and are directing their attention to other objects of agriculture. One of these, the sugar cane has been tested in various parts of the State, with encouraging success. The Greensborough Beacon, says that it has recently been shown several stalks of sugar cane, raised by Col. John Erwin, near his residence, which would compare favorably with any raised in Louisiana. One of the stalks had 20 well matured joints, the largest of which measured nearly 5 inches in circumference. Two other stalks had each 18 well matured joints, one of which measured 5 1-8 ins. in circumference. Two of these stalks measured seven of mature joints, and in the field from which they were gathered, were many others quite as large.—Several instances were noticed in which 10 or 12 fine, healthy stalks had grown from one eye. This crop of cane was grown in sandy bottom. If its cultivation is thus successful in the upper counties, why should it not meet with greater success in the lower? Experiments were made some fifteen years ago which proved unsuccessful in consequence of early frost preventing the necessary maturity of the plant, and the absorbing passion of cotton culture which reached its highest point soon after, put an end to the enterprise. Now that the winters are milder, and cotton does not yield a living recompense, the experiment will be tested more extensively.

Honey from the Prairie State.

We have received a box of honey from Mr. D. Lathrop's Apiary at La Salle, Ill. It was made this year in his American Bee Palace, and if ever bees made crystal nectar, it were the bees of Mr. Lathrop. Talk of ambrosial sweets, we must either go to Illinois for them or they must be sent from thence. Dutchess county may be the land for milk, but assuredly La Salle is the land for honey.

" On books deep poring ye pale sons of toil,
Who spend in studious trance the midnight oil,
Say now, can ye half equal with your rules,
Acquired in English, Greek or Latin schools,
This honey comb. Instinct her only guide,
A heaven taught insect baffles all your pride."

Baltimore Mechanics Institute.

We have received from Mr. Thomas I. Clare, Secretary of the Merchants Shot Works Baltimore, a copy of the Constitution and Bye Laws of the Maryland Institute for the Promotion of the Mechanic Arts, together with a Catalogue of the articles exhibited at the Fair held in Baltimore on the 31st of October last. We have been informed that the exhibition at the Fair, was highly creditable to the Institute both in respect to the number and originality of the articles exhibited. Mr. Benson exhibited his excellent combination rotary engine and Mr. Page his Wind Mill, both of which we have noticed before in the Scientific American. Two oscilating steam engines were exhibited, something of which we cannot boast in respect to the Fair held in our city. One was by Messrs. Murray and Hazlehurst and Messrs. Bently & Co. Baltimore. We hope to see these simple engines come into more general use. The first premium at the Fair for the best rotary ship pump was awarded to Mr. A. W. and J. H. Von Schmidt, of this city. We should like to have noticed more of the articles exhibited and the prizes that were awarded, but we have not room and we can only state that a general satisfaction was felt by those who exhibited their articles both in respect to the management of the Fair and the impartiality of the awards. Mr. Benson who had charge of the engine room was untiring in his exertions to make all things *go well*, and Mr. Amos Gore the general superintendent conducted all things in the most admirable manner, and so satisfied were the exhibitors that they published a card expressing their respect and thanks for the attention paid to them. The card was signed by persons from all parts of the Union—thus showing that it was no local feeling which induced them to publish the same.

The American Institute.

It is expected that the election for a Secretary of the American Institute, in place of Mr. Wakeman, deceased, will be held on the second Thursday in this month, but this is not certain, since the election may be postponed until the annual election on the second Tuesday of May. Mr. Chambers, the gentlemanly Clerk of the Institute, is spoken of as being the person best qualified and most likely to fill the vacancy by the death of the late Corresponding Secretary.

A Group for the Capitol.

Greenough the sculptor is at work on a composition designed for the Capitol at Washington: " He has chosen an early settler, whose home is attacked by an Indian. The hardy borderer has seized the savage with the calm dignity of confidence ; holds his right hand, which was uplifted with the fearful tomahawk clinched firmly, in his own, while his other holds the body in its secure position. Beside is the mother, who gazes upon her infant, which she has snatched from danger, with feelings of pleasure and gratitude beaming in her countenance. The whole is attired in a manner peculiarly national, and the result of which will illustrate an important point in the history of our country, and in the progress of humanity from barbarism to civilization."

Perseverance of the Blind.

Miss C. S. Smiley late pupil of the Pennsylvania Institution for the Blind, has made a quilt of the ordinary size, but the pieces count the extraordinary number of fifty five thousand five hundred and fifty two.

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Woodworth's Planing Machine.

The following are the opinions of Judge Kane, delivered in the U. S. Circuit Court on the 17th of August 1846, relating to the conflicting claims of Woodworth and others.

The merits of the case and the comparison of various planing machines are here entered into and are worthy of attention.

This case came before the Court on a motion to restrain Mercer and Pechin, by special injunction, from constructing selling, and using Woodworth's planing, tongueing, and grooving machine, or any of the parts or combination thereof.

It was very fully examined and ably argued by the gentlemen who are of counsel in the several cases growing out of Mr. Woodworth's patent-right; and it was agreed, that the evidence adduced in the case of Sloat and Plympton, which was considered immediately after this should be applied in both cases.

The facts, so far as they are undisputed, are these:

On the 27th December, 1828, letters-patent were issued to William Woodworth, of Troy in the state of New-York, conferring on him exclusive property of his "Improvements in the method of planing, tongueing, grooving, and cutting into mouldings, or either, plank, boards, or other material."

The patentee having died on the 9th of Februrary, 1839, letters of administration on his estate were duly granted to his son, William W. Woodworth, by the Surrogate of New-York, at which place the father was residing at the time of his death.

On the 29th July 1832, the administrator applied for extension of the patent for 7 years: and the Board of Commissioners, to whom the application was referred, under the act of 1836, having certified in his favor, the patent was extended in the name of the administrator as such.

On the 8th July following, the administrator surrendered his letters-patent, in accordance with the provisions of the 13th sec. of the act of 1836, for the purpose of obtaining a renewal upon an "amended specification, describing the invention in more full, clear exact terms," and the amended patent issued to him on the same day, under the ~~hand of the~~ Secretary of State, countersigned and sealed with the seal of the Patent-office, by Henry H. Sylvester, Acting Commissioner of Patents.

The complainants claim under a grant of the exclusive right within and throughout the county of Philadelphia, made by the administrator, on the 29th November 1842, and duly recorded.

It is admitted, that the defendants, Plympton and Hogeland have been using, and they claim the right to use again, a machine, known as Ira Gay's which effects the same purpose as Woodworth's and which is alleged by the complainants to be in principle and substantially the same.

Upon these facts, several preliminary questions have been discussed by the counsel for the parties, which I shall briefly consider.

1. It is said that the administrator had no power to surrender the patent of 1828, after assigning exclusive rights under it, and that the new letters-patent, being founded on such surrender, are void.

It is not easy to see how this objection, if valid, could affect the case before the court.—The complainants do not claim under the new letters-patent, but under the old; and these cannot have been invalidated by an unlawful surrender of them.

But it seems to me a mistake, to regard the complainants, or any other persons whose rights have been brought to the notice of the Court, as assignees within the meaning of the patent laws. There are four classes of persons recognized by the 13th and 14th sections of the act of 1836, as parties "interested." These are the original patentees, their executors or administrators, their assignees, and the grantees under them of the exclusive right for a specified part of the United States. These last, by the express words of the 24th section have the same rights of suit as the patentee or his assignees; and it is by force of this, that the complainants, who are merely grantees of a limited right, are admitted as parties here. But they have no power over the letters-patent: these remain with the party to whom they were issued, or the general representative of his interest; and the power of surrendering them for amendment and renewal is vested exclusively by the 13th section in the "patentee, his executors and administrators, or the assignee of the original patent." The administrator, therefore, upon the facts disclosed, was the only person who could make the surrender and receive the amended patent; and there is nothing in the act of congress which restricts his right to do so, because of his having previously made special or limited grants of licenses.

2. It is said, that the amendments of the specification, as made upon the re-issue of the patent in 1845, do not enure to the benefit of the assignees or grantees under the patent, as it stood before; in other words, that they must stand or fall with the original specification.

I cannot assent to this. The complainants are not grantees of the patent, or any part of it: they are grantees of certain rights, of which the letters-patent are the evidence and definition. If those rights are made more clear and definite (not more extensive) by any new or additional act whatever, from whomsoever proceeding, why shall the complainants be denied the advantage of using that clearer and less equivocal evidence?

This is not the case of a surrender and reissue with amended specification, where the grantee for a district prefers resting his claims on the specification as it stood when he purchased his right. As where the patent makes a disclaimer of part of the invention the prior grantee might in such case refuse to be affected by it. But here the objection comes from third persons: the complainants adopt the amended specification, by making it part of their bill; and the only inquiry is as to their authority for doing so. The question is settled as to third parties by the provision of the act, that the amended specification shall have the same effect and operation in law, on the trial of actions, as though it had been originally filed in its corrected form.

3. The 5th section of the act of 1836, directs that all patents shall be issued under ~~the seal of the patent office, and be signed by~~ the Secretary of State, and countersigned by the Commissioner: it is argued that this patent is invalid, because signed by an *acting* Commissioner.

Mr. Sylvester, the countersigning officer, was the chief clerk of the patent office at the time; and as such, by the words of the 2d section of the act, in all cases, during the necessary absence of the Commissioner, or when the principal office became vacant, had the charge and custody of the seal, records, and other things belonging to the office, and was required to "perform the duties of Commissioner *during such vacancy*." It is contended by the complainants, that the words "during such vacancy," apply as well to the case of necessary absence of the Commissioner, as to that of the Commissionership being vacant by death, resignation, or removal.

This may be a grave question. I am not prepared to say, that the absence of the Commissioner, while he retains his official character, contsitutes a vacancy in the office; or that the inferior officer can succeed to or exercise the powers of the principal station, while that station has a lawful incumbent. But I do not regard the question as properly before me, at least at the present stage of the cause. I recognize the signature of the secretary of state, the public seal of the patent office, and the countersignature of a person who has the custody of it during the absence of the principal Commissioner, and the right to use and attest it in a certain contingency. I find him designating his official character for the time, by words that imply his legal substitution to the duty in question. There is no allegation of fraud or usurpation on his part: on the contrary, his act is sanctioned by the Commissioner now acting in person.

(*To be continued.*)

English Artists.

Mr. Geo. Earl the celebrated draughtsman and inventor of the Geometrician is now in this country, and is going to teach his method of perspective and the mode of reducing large drawings by his instrument.

Meteorites—Their Origin.

In a long and able essay on Meteorites Prof. C. U. Shepard holds the theory that they are in reality of terrestrial origin. He draws numerous deductions from facts within his own sphere of observation, and observes that their extra-terrestrial origin seems likely to be more and more called in question, with the advance of knowledge respecting such substances and as additions continue to be made to the connected Sciences.

Prof. Shepard then proceeds in the following language. His views are presented with great vigor and clearness, and will be found very interesting:

"The recent study (he says) of those frequently occurring and wide-spread atmospheric accumulatioas of meteoric dust, (a single case being recorded where the area must have been thousands of square miles in extent and where the quantity of earthy matter precipitated must have been from 50 to 100,000 tons in weight,) makes known to us the vast scale on which terrestrial matter is often pervading the region of the upper atmosphere; and prepares us to appreciate the mode in which the peculiar constituents of meteorites may be translated to those remote distances, where, according to the theory of Biot, the clouds of metallic dust are retained.

"Great electrical excitation is known to accompany volcanic eruptions, which may reasonably be supposed to occasion some chemical changes in the volcanic ashes ejected; these being wafted by the ascensional force of the eruption into the regions of the magneto polar influences, may there undergo a species of magnetic analysis. The most highly magnetic elements, (iron, nickle, cobalt, chromium, &c.) or compounds in which these predominate, would thereby be separated, and become suspended in the form of metallic dust, forming those columnar clouds so often illuminated in auroral displays, and whose position conforms to the direction of the dipping needle. While certain of the diamagnetic elements, (or combination of them,) on the other hand, may, under the control of the same force, be collected into different masses taking up a position at right angles to the former, (which Faraday has shown to be the fact in respect to such bodies,) and thus produce those more or less regular arches, transverse to the magnetic meridian that are often recognized in the phenomena of the aurora borealis.

"Any great disturbance of the forces maintaining these clouds of meteor-dust, like that produced by a magnetic storm, might lead to the precipitation of portions of the matter thus suspended. If the disturbance was confined to the magnetic dust, iron masses would fall; if to the dia magnetic dust, a non-ferruginous stone; if it should extend to both classes simultaneously, a blending of the two characters would ensue in the precipitate, and a rain of ordinary meteoric stones would take place.

"As favoring this view, we are struck with the rounded, hailstone form of many of the particles of composition (even though consisting of widely different substances) in nearly all stones, and even in many of the iron-masses. Nor are these shapes to be referred to fusion! they evidently depend upon a cause, analogous to that which determines the same configuration in hailstone themselves.

"The occasional raining of Meteorites might therefore be as much expected, as the ordinary deposition of moisture from the atmosphere. The former would originate in a mechanical elevation of volcanic ashes and in matter swept into the air by tornadoes, the latter from simple evaporation. In the one case, the matter is upheld by magneto-electric force; in the other, by the law of diffusion which regulates the blending of vapors and gases, and by temperature. Precipitation of metallic and earthy matter would happen on any reduction of the magnetic tension; one of rain, hail or snow, on a fall of temperature. The materials of both originate in our earth. In the one instance they are elevated but to a short distance from its surface, while in the other they appear to penetrate beyond its farthest limits, and possibly to enter the inter-planetary space; in both cases, however, they are destined, through the operation of invarible laws to return to their original repository."

Effect of Colored Glass upon Vegetation.

Violet-colored glass is stated to have been first used in France, for aiding the ripening of grapes; the rationale of the experiment being the partial exclusion of the caloric rays, and the greater encouragement of the chemical rays. In England the experiment has failed; and French beans and strawberry-plants grow rapidly under violet-colored glass, but were long, spindly, and tremulous; in short, very unhealthy. A very light green has been found to answer better than a colorless glass for conservatories; and by recommendation of Mr. Hunt, author of "Researches on Light," &c., the new vast conservatory at Kew has been glazed with this kind of flat glass, in order to afford the plants protection from the scorching heat of the meridian sun. A great improvement would be effected by the panes being of an arched form, and placed in such an aspect that the morning and even ing rays of the sun would not have a tendency to reflect the rays back again, as is the case with thick glass, the irregular thickness of which, when the rays pass through them at right angles, act as burning glasses; whereas, by the arrangement above suggested, the rays would pass in direct course through the glass and the condensed "drip" on the inside would be effectually carried of by the channels on each side of the interior of the frames.

Peculiarities of Distinguished Public Men.

A Washington letter-writer, in describing the peculiarities of some distinguished public men, says:

"It is interesting sometimes to see the different individuals get out of the same dilemma. Mr. Calhoun is not often at a loss for a word, but occasionally one sticks in his throat, in the pronunciation, like Macbeth's '*Amen.*' In such a case he gives a petulent twitch or two at his shirt-collar, and runs his bony fingers through his long gray hair till it fairly bristles again. Webster, when bothered for a word, or snarled up in a sentence, almost invariably scratches the inner corner of his left eye, carefully, with the third finger of his right hand. Failing in this, he rubs his nose quite fiercely with the bent knuckle of his thumb. As a *dernier resort*, he springs his knees apart until his legs resemble an elipsis, then plunging his hands deep in his pockets, he throws the upper section of his body smartly forward, and the word is '*bound* to come.' Gen. Cass, in a similar predicament passes his hand rapidly along the lower edge of his vest. Mr. Benton sinks his voice so that the remainder of his sentence is unintelligible. Mr. Mangum is violent, and the obdurate word is supplied by 'Occ-hoc-shoo!' Mr. Johnson, of Maryland, Crittenden, and Mr. Hannegan, are never bothered: they 'speak right on," and their drafts upon the President's English are never dishonored."

A Petrified Forest.

M. Blast, Bombay, has discovered, in the neighborhood of Cairo, an entire forest converted into silex; the vessels, medulfary rays and even the most slender fibres, are distinctly visible. The petrified trees are from sixteen to eighteen metres in length. This phenomenon extends over a surface of many hundred miles. The whole desert which is crossed by the road from Cairo to Suez, is strewed with these trees, which seem to have been petrified on the spot, and in the existing era. At least, the forest is covered by nothing more than sand and gravel. The latter, and the trees imbedded in them, rest on calcareous limestone, which contain oysters, with their texture and color so little altered, that one would believe them to have been left but recently by the water of the sea. It is therefore probable that these substances belong to our own era; and we may adduce this interesting fact as tending to prove the tranformation of living shell into new calcareous carbonate.

Cholera.

The British Royal College of Physicians have issued a cholera circular, in which they distinctly say that they do not inderdict any well prepared food, or prescribe any particular treatment. Want of nourishment, want of fuel and want of clothing are considered the greatest causes of cholera.

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TO CORRESPONDENTS.

"B. T. of Me."—The quantity of water discharged through an opening of 100 inches area and over a fall of 6 feet is 6,61 cubic feet, (100 is the radical.) To produce one horse power with a six feet fall, will require an area to discharge 2 5-6 cubic feet per second of about 49 inches. Water falls through a space of 4 feet in half a second, 16 feet in one second, &c. You will see that it is not possible to occupy room to answer all your questions, but you will find an answer in Leonard's Mechanical Principia—a book which all Millwrights should have. Some Corn Shellers work faster than others. See on front page.

"D. B. of Mass."—We have forgotten who the inventor of that Wadding Machine was, or where he resides. If we hear from him again we will address you by letter.

"M. D. of Ala."—You have guessed right as to the cause of the paper being stopped.—Yes, send P. O. stamps.

"E. W. of N. Y."—For a full description of Daniel's Planing Machine, see No. 7, vol. 4. We have one of that description to sell for $250 cash. Galvanized iron would answer your purpose and would not rust.

"A. G. L. of O."—That machine is worth more to a person who wants to use it here, than to ship so far as your place.

"B. B. of Boston."—We have had no reply yet to those enquiries we have made of you. Send on the duplicate certificate of deposit and we will straighten the business at once.

"H. T. S. of Ohio."—We have received the amount you enclosed, and will carefully prepare your papers.

"C C. L. of Mass."—We have heard of a clock that was invented a few years ago in Mass. to wind itself up, and there are clocks now in operation that never need to be wound up at all—no chains, weights, &c. required. They will go for a hundred years—and are now in our city. They are operated by electro magnetism.

"G. M. of Mass."—Address a letter G. M. Carleton, Brunswick, Maine, and your questions will be answered. We think it is an excellent invention and have a model of itat our office. We can probably give you the information in regard to the new process of tinning in a few days.

To Patent Correspondents.

"B B. of Me."—We should not advise you to send your model to Washington until you have applied for letters patent. The Commissioner will not notice it, and you only expose your invention without deriving any information. Many thanks for the fine list of subscribers last received from you.

"G. A. G. of Ct."—Some of your inventions appear very good and are apparently worth patenting. If we have an opportunity to do anything for you we will address you by mail.

"G. W. C. of Maine."—To be compelled to read that specification which you sent to us is a very hard task. No wonder Commissioner Burke returned it to be condensed. We will attend to it the first leisure day we have, or if you are in a hurry for it please send five dollars and we will attend to it immediately. The model, drawing, &c. are all received.

"C. D. M. of N. Y."—We cannot attend to your business unless you place the model in our possession and pay in advance the required sum. You should have applied to us first and then your business would have been attended to properly.

"H. D. C." "F. H. A." "N. C. F." and "C. H. M. & Co."—We sent your specifications and drawings to the Patent Office last Wednesday, and will write to you by mail as soon as we have returns from the Commissioner.

"C. McC. of Pa."—A patent was applied for last Spring, for a machine on the same principle, and constructed very nearly like yours.

"M. R. C. of Mass."—We will attend to your patent business as soon as the model comes to hand. Thirty dollars received, all right

"W. F. of N. J." and "S. T. of N. H."—We shall be able to attend to your business next week. Thirty dollars from *each* received.

"C B. H. of N. Y."—Both of your patent cases are being attended to this week. We shall send the specifications to you for signing next week.

☞ We wish that our Correspondents would be as brief in their communications as possible and particularly do we desire that they would not close their letters by saying "Please send a bill of your charges for the information solicited and we will forward the amount by return of mail" Now Gentlemen that is not the way we desire you to do. We wish you to be your own judges as to what the information is worth to you and send such amount as is your pleasure to do, and in all cases we shall be perfectly satisfied.

Tall Telegraph Poles.

Probably the "Tallest" specimen of Telegraph poles in the world is to be seen where House's Philadelphia line crosses the Hudson river. On the New York side a single pole has been erected, the peak of which is considerably higher than the cross on Trinity church steeple. It is over four hundred feet above the surface of the river. On the Jersey shore the pole is erected on the Pallisades, close by Fort Lee, and its peak it about seven hundred and fifty feet above the river. The distance between the two poles is about one mile and two steel wires are suspended across—probably the most successful achievement of the kind in the world.

Advertisements.

☞ This paper circulates in every State in the Union, and is seen principally by mechanics and manufacturers. Hence it may be considered the best medium of advertising, for those who import or manufacture machinery, mechanics tools, or such wares and materials as are generally used by those classes. The few advertisements in this paper are regarded with much more attention than those in closely printed dailies.

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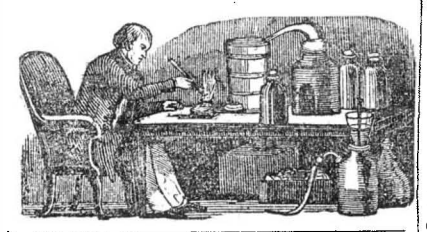


For the Scientific American.

New Chemical Law.

No. 12.

Proceeding in the same manner for the formation of another aggregated series, as we did for the formation of the aggregated series composing nitrogen, chlorine, bromine and iodine, we may probably derive the following aggregated series, produced by the aggregation of a radical possessing an atomic weight of 7.6.

Phosphorus 7.6X4=30.40. specific gravity 1.77, boiling point 550°. solid.

Arsenicum 7.6X10=76.00, sp. grav. 5.96, solid.

Antimony 7.6X17=129.20, sp. grav. 6 80, solid.

Bismuth 7.6X28=212.80, sp. grav. 9.90, solid.

These substances also possess similar chemical properties. When phosphorus is exposed to the atmosphere, it emits a peculiar odor of garlic, which is exactly the case when arsenic is heated in contact with the air, but as we proceed higher in the series no such odor is emitted. Their specific gravities it may be seen are on a regular increase, and the same may be said of their boiling points. Although arsenic sublimes at the temperature of 356°, yet it is probable that its boiling point is much higher, as it is certain that its melting point is much higher than its sublimation point.—The gradual increase of similarity continues up to bismuth, and although bismuth may possess no apparent connection with phosphorus yet the chain of similarity is complete, phosphorus being similar to arsenic, arsenic to antimony, and antimony to bismuth. The other conditions required of an aggregated series are also fulfilled. It may also be seen that this class, like the previous one of sulphur, &c., gradually increases in metallic properties, thus phosphorus is a non metallic substance: as the series increase the metallic properties increase, as may be seen in Arsenicum, antimony and bismuth. The decrease in affinity as the series increase, may be plainly seen in the affinity of these substances for oxygen. Thus phosphorus has such an affinity for oxygen, as often to enter into spontaneous combustion at common temperatures, while arsenic only requires a moderate heat to oxidise and form arsenious acid, but antimony requires a still greater heat before it forms antimonious acid. Bismuth also requires a great heat to oxidise. The following example shows the atomic weights of these substances, as produced by calculation and experiment.

	By Calculation.	By Experiment. Kane.	Turner.
Phosphorus	7 6X4= 30.40	31.44	31 40
Arsenic	7 6X10= 76.00	75.34	75.40
Antimony	7.6X17=129.20	129.20	129.20
Bismuth	7.6X28=212.80	213.30	71.00

There is considerable doubt among chemists, as to the true position of the atomic weights of arsenic, phosphorus and bismuth—some considering the atomic weights of phosphorus and arsenic one half of the numbers given above, and bismuth one third.—This law plainly indicates that the atomic weights as given above are correctly situated, which is in accordance with recent views on the subject. The following example shows the constitution of their acids, by which it may be seen that an equal number of atoms of oxygen are required to form an acid, according to the requirements of the law.

	Sp. Gr.	
Phosphoric Acid 4R+O5.	2 987	solid.
Arsenic Acid 10R+O5.	3.391	solid.
Antimonic Acid 17R+O5.	6.250	solid.
Bismuthic Acid 28R+O5.		solid.

These substances will upon examination, also show a perfect chain of similarities. No boiling points are given. Arsenic acid and phosphoric acid produce combinations with water, showing a close similarity. The following gives an example of their sulphurets.

Sulphuret of Phosphorus

Sulphuret of Arsenic 10R+S3. yellow solid.

Sulphuretof Antimony 15R+S3. orange yellow solid·

Sulphuret of Bismuth 28R+S3. grey solid.

The compounds of sulphur and phosphorus have not been sufficiently investigated to ascertain their composition. The following is an example of their chlorides.

Chloride of Phosphorus 2R+Cl.3. liquid.

Chloride of Arsenic 10R+Cl.3 liquid.

Chloride of Antimony 17R+Cl.3. solid.

Chloride of Bismuth 58R+Cl.3. solid.

The specific gravities and boiling points of these substances probably increase. Their similarity with one another is also perfect, and they also increase in general density—the first two being fluids and the last two both solids resembling butter, and termed the butters of antimony and bismuth. Other compounds exist of this class resembling each other in their chemical properties. Thus they all, with the exception of bismuth unite with precisely three atoms of hydrogen, to form gases, also resembling each other in their chemical properties. The probable reason of no compound of bismuth with hydrogen having been discovered, is owing to the 11th section of the law, it being the highest substance in the series.

S. N.

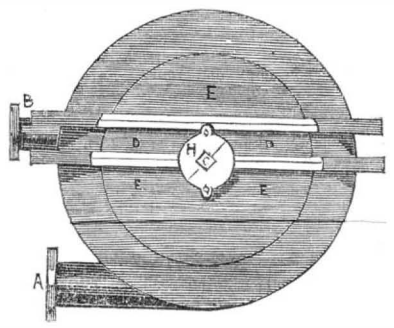
Bridgeport, Conn.

History of the Rotary Engine.

Prepared expressly for the Scientific American.

HORNBLOWER'S ROTARY ENGINE.

Fig. 22

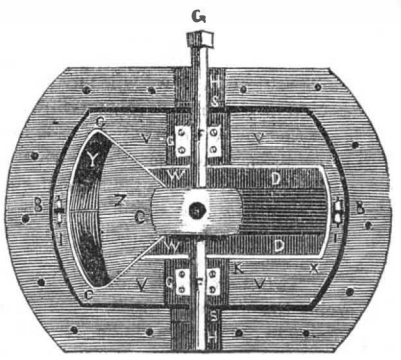


This is a second rotary engine invented by the ingenious Jonathan Hornblower and patented we believe in 1803. It is a steam wheel of curious construction and described by Dr. Gregory in his Mechanics, but as the description is necessarily long, we forbear making any comments.

Fig. 22 a cast iron globe with flattened poles. Fig. 23 is an interior view of fig. 22 and Fig. 24 are the parts that move round within the steam iron globe. The pipe A, at Fig. 22 receives the steam from the boiler, to which is connected a valve box, of any usual construction, by which to regulate the admission of steam. At B the eduction pipe is connected, leading from the upper apartment to the condensing apparatus, and turning in such a direction as may be most convenient for the discharging pump to be brought by means of an arbor, turned by the axle of the machine, on which arbor is a small fly wheel, for the purpose of regulating the inequality of the crank to which the pump rod is attached. D D is a middle part of the steam vessel, furnished with flanges for the purpose of screwing it to E E, and also for receiving the lid; by which means the partition within is secured to its place in the middle of the machine, and the lid may easily be removed for the purpose of rectifying and repairing the internal structure. G is the square part of one end of the axis of the machine, over which is placed a gland H, divided into parts, in order that it may be put on over the square, and properly embrace the round part of the axis. Within this gland is a stuffing-box for the purpose of keeping the axle both air and steam tight. In one side of the lower appartment of the steam vessel is a small opening, secured by a lid, for the purpose of cleaning that part of the machine.

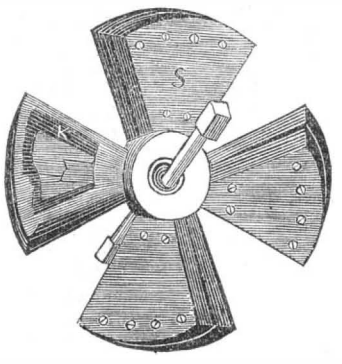
Fig. 23 represents the partition within the steam vessel, which may be made either of brass or iron, or of both those metals combined. B B, is the lower flange, the upper part being taken away. C C, are the two openings or passages for the vanes: these the inventor calls vane-ports, and to obtain a proper idea of the figure. it must be observed that the largest vane-port is formed by the exterior portions of two cones Z, and at Y, by a portion

Fig. 23.



of the concave part of a sphere. The extent of this passage throughout must at least be equal to ninety degrees of a circle, and the vanes of a sufficient width, so that two of them may always make their entrance into the vane ports before the other two make their exit. The edge, C C, may, therefore, be supposed to descend into the lower apartment one half of their depth, and to rise the other half to meet the eye; but it is not necessary that Z be so deep all the way as Y, but converge towards the centre of the machine. This is the ascending vane port; the descending one is included between D D, which are rabbets or seatings for receiving a packing; and X represents a rising edge, so as to obtain a depth at least equal to the thickness of the vanes; one half of which edging is below, and the other half above the main axis. These edges receive two metal plates, fixed down with screws on them, for the purpose of confining the packing. The part E is also formed spherically, and is provided with a packing groove which meets the edge of metal in the middle of the vanes, K, Fig. 24. F F, is the main axle of the machine, laid in its place without the vanes; one end of which is to perform the work required, and the other is applied to the discharging pump. At D D, the packing extends to W W, so as to embrace the nave as well as the descending vane, by which means both the nave and the vanes move steam tight in their revolutions. V V V V is that part of the partition which forms a plane at the axes of the globe, and is secured in its place by being seated in a rabbet with the usual jointing materials on the interior margin of the steam vessel. G G, are two brasses let down into the partition, and they are raised or depressed by screws as adjustment may require. At T T, spaces are left for packing round the axle; and the upper brasses which keep down the axle serve also to keep it in its place. At H H, are the stuffing boxes mentioned in fig. 22; they have a division plate of metal in them, so that S S, being applied with steam from the valve box, the packing

Fig. 24.



of each side of these vacuities are rendered air tight. The manner in which the partition and vane ports are constructed, is by rivetting the two V V V V, together, by means of flanges at I I, first having mounted them on an axis, to correct, by turning, (either by hand or otherwise) the want of smoothness and truth from the casting; and when this is done the main axle is fixed to its place as a guide by which to set up the four vanes, as at Fig. 24, where, by a mere inspection, it is plain how this is performed. The open vane exhibits a frame of metal, which receives a plate on each side: these plates, with the edge of metal, C, cast with the frame, form grooves and vacuities to receive the packing. The nave being hollow receives two iron axles, which are curved in the middle, and there cross each other.

The manner in which they receive the vanes is shown by the figure; also how the packing renders them steam tight on the spherical part of the nave, and that when one of them is moved, its opposite vane on the same axle must be moved. The main axle is turned true by rivetting the two parts together at the nave, and re-rivetting them after the cross axles are set in their places All the several parts of the machine being then put in their respective situations, it is very evident that when steam is admitted into the lower apartment the rising vane, which occupies the largest passage, must overpower the other in its descent; and that, if by any means one of the vanes be turned a quarter of a revolution, it must at the same time carry with it the one which is connected on the opposite side of the nave; and this turning is effected by fixing with screws a block of wood, on the partition at K, in the form of a strong bracket. This block will not permit the ascending vane to pass it without being turned on its edge, by which means the one below is turned at the same time, to present its board surface to the large vane port. It may be necessary to remark that when the machine is to be set at work, the steam is not admitted into the upper apartment of the vessel, to exclude the air, but enters immediately from the valve box to the eduction or discharging pipe, in order to preserve the grease which is made use of to lubricate the internal moveable mechanism of the engine.

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